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Notes:
1. Untranslatable words are replaced with asterisks (****).
2. Texts in the figures are not translated and shown as it is.

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Dictionary: Last updated 12/14/2009 / Priority:

FULL CONTENTS

[Claim(s)]

[Claim 1]A navigation device comprising:

A map information storing means which stores beforehand map information showing what kind of road and institution are where.

A present position detection means which detects a current position of vehicles.

A tab-control-specification means to specify one on a map based on said map information of positions.

A search means to search an institution in the circumference of said specified position covering two or more kinds based on said map information, An extraction means to extract a searched institution in order near said specified position, and an institution displaying means which displays on a map an institution extracted by said extraction means based on said map information, A course setting means to shift, and to calculate and set up a course from said current position to said destination by making that institution into a destination based on said map information to be displayed on said institution displaying means, and guide mechanism to which it shows a set-up course.

[Claim 2]The navigation device according to claim 1 having a kind setting means to set up a kind of institution searched.

[Claim 3]The navigation device according to claim 1 or 2 setting up so that a position specified by said setting means may turn into a current position of vehicles detected by said present position detection means.

[Claim 4]A navigation device given in any 1 paragraph of Claims 1-3 characterized by comprising the following.

A list display means to display a list of kind names of said institution.

A destination setting means which sets up an institution used as a destination of a course setup by said course setting means based on a kind name in a list displayed on said list display means.

[Claim 5]A navigation device given in any 1 paragraph of Claims 1-4 which is provided with the following and characterized by setting up said institution displaying means to display an institution near said current position on the next of an institution displayed now among institutions corresponding to a kind name with said selected selecting means.

A list display means to display a list of kind names of said institution.
A selecting means which chooses a kind name in a list displayed on said list display means.

[Claim 6]A navigation method comprising:
A step which stores beforehand map information showing what kind of road and institution are where.
A step which detects a current position of vehicles.
A step which specifies one on a map based on said map information of positions.
A step which searches an institution in the circumference of said specified position covering two or more kinds based on said map information, A step which extracts a searched institution in order near said specified position, and a step which displays an extracted institution on a map based on said map information, A step which shifts, and calculates and sets up a course from said current position to said destination by making that institution into a destination based on said map information to be displayed, and a step to which it shows a set-up course.

[Claim 7]The navigation method according to claim 6 containing a step which sets up a kind of institution searched.
[Claim 8]The navigation method according to claim 6 or 7 containing a step which makes a position on a map specified said current position.
[Claim 9]Map information showing what kind of road and institution are by controlling a computer where is made to store beforehand, Make a current position of vehicles detect and one on a map based on said map information of positions is made to specify, An institution in the circumference of said specified position is made to search covering two or more kinds based on said map information, One which made display an institution which made order near said specified position extract a searched institution, and was extracted on a map based on said map information, and was displayed of institutions is made into a destination, Software for navigation making a course which made calculate and set up a course from said current position to said destination based on said map information, and was set up guide.

[Detailed Description of the Invention]
[0001]
[Field of the Invention]In this invention, it is related with navigation technology.
Therefore, it improves to the function to search the institution around a specific position on a map especially.

[0002]
[Description of the Prior Art]In recent years, the navigation device shown by carrying in vehicles has spread quickly with the spread of cars, and development of the Data Processing Division art. A navigation device guides the point turning [right] left etc. by a map display, a synthetic voice, etc., calculating and setting up the optimal course to the specified destination based on the map information showing a road etc., and detecting a self-vehicle position one by one with GPS or autonomous

navigation.

[0003]In order to receive guidance by a navigation device, a user needs to set up the destination. A setup of this destination can be performed by specifying the specific point on a display map with cursor. It is also possible to search and set up the destination based on search conditions, such as the area and a name. A self-vehicle position or the specific circumference institution of a point is searched based on the kind (it is hereafter called a genre) of the institution, and it also has the function displayed on near order.

[0004]Search of a circumference institution is performed by, for example, narrowing down the name displayed in a list, as it was called the genre -> retail store -> foodstuffs -> convenience store. And it can be considered as the mark at the time of choosing the institution used as the purpose by assigning the icon according to that kind beforehand to each institution, and displaying this icon in the case of a list display. Since the icon assigned in this way is displayed also when it displays an institution on a map, it can perform the position of institutions, and the check of a kind by considering this as a mark.

[0005]

[Problem to be solved by the invention][by the way search of the institution around the present location in the above car navigation devices, or arbitrary points] The user was made to choose one genre, and since it carried out by narrowing down in the genre, only the institution contained in the genre was only listed. Therefore, it could not but search separately by repeating the respectively same operating procedure about each genre to search by covering two or more genres.

[0006]For example, to search the convenience store and family restaurant around a parking lot which are destinations. A genre -> retail store -> foodstuffs -> after searching a convenience store with the procedure of a convenience store, the family restaurant had to be searched with the procedure of genre -> restaurant -> Juarez, and it had taken the user's time and effort.

[0007]Were proposed in order that this invention might solve the problem of the above conventional technologies, and, [the purpose] It is in providing the art, i.e., the navigation device, the method, and the software for navigation of the navigation which can search and display the institution near the specific position on a map for a short time covering two or more kinds by easy operation.

[0008]

[Means for solving problem]This invention is characterized by the navigation device of Claim 1 comprising the following, in order to attain the above-mentioned purpose.

The map information storing means which stores beforehand the map information showing what kind of road and institution are where.

The present position detection means which detects the current position of vehicles.

A tab-control-specification means to specify one on the map based on said map information of positions.

A search means to search the institution in the circumference of said specified position covering two or more kinds based on said map information, An extraction means to extract the searched institution in the order near said specified position, and the institution displaying means which displays on a map the institution extracted by said extraction means based on said map information, A course setting means to shift, and to calculate and set up the course from said current position to said destination by making that institution into the destination based on said map information to be displayed on said institution displaying means, and the guide mechanism to which it shows the set-up course.

[0009]Claim 6 this invention is characterized by a navigation method comprising the following.
The step which stores beforehand the map information showing what kind of road and institution are by catching the invention of Claim 1 from a viewpoint of a method where.
The step which detects the current position of vehicles.
The step which specifies one on the map based on said map information of positions.
The step which searches the institution in the circumference of said specified position covering two or more kinds based on said map information, The step which extracts the searched institution in the order near said specified position, and the step which displays the extracted institution on a map based on said map information, The step which shifts, and calculates and sets up the course from said current position to said destination by making that institution into the destination based on said map information to be displayed, and the step to which it shows the set-up course.

[0010][the software for navigation of Claim 9] [by catching the invention of Claims 1 and 6 from a viewpoint of computer software, and controlling a computer] The map information showing what kind of road and institution are where is made to store beforehand, Make the current position of vehicles detect and one on the map based on said map information of positions is made to specify, The institution in the circumference of said specified position is made to search covering two or more kinds based on said map information, One which made display the institution which made the order near said specified position extract the searched institution, and was extracted on a map based on said map information, and was displayed of institutions is made into the destination, The course which made calculate and set up the course from said current position to said destination based on said map information, and was set up is made to guide.

[0011]In above Claim 1 and the invention of 6 and 9, since the institution around the specified position can be displayed on near order covering two or more kinds, the time and effort and time of search operation of a circumference institution are not taken, but the destination of course calculation can be set up quickly.

[0012]The invention of Claim 2 has a kind setting means to set up the kind of institution searched, in the navigation device of Claim 1. The invention of Claim 7 catches the invention of Claim 2 from a viewpoint of a method, and contains the step which sets up the kind of institution searched in the navigation device of Claim 6. In above Claim 2 and the invention of 7, since a user can set up beforehand the kind of institution which is the target of search and extraction, by narrowing down and setting to the institution of the kind used well, improvement in the speed of search and extraction can be attained, and the information on institutions to know can be acquired quickly.

[0013]In the navigation device of Claim 1 or Claim 2, the invention of Claim 3 is set up so that the position specified by said setting means may turn into a current position of the vehicles detected by said present position detection means. The invention of Claim 8 catches the invention of Claim 3 from a viewpoint of a method, and contains the step which makes the position on the map specified said current position in the navigation method of Claim 6 or Claim 7.In above Claim 3 and the invention of 8, since the current position used as the starting point of the usual course guidance turns into a reference position of search and extraction of a circumference institution automatically, the time and effort as which a user specifies a position can be saved.

[0014]The invention of Claim 4 is [this invention] characterized by that the navigation device of any 1 paragraph of Claims 1-3 comprises the following.

A list display means to display the list of kind names of said institution.

The destination setting means which sets up the institution used as the destination of a course setup by said course setting means based on the kind name in the list displayed on said list display means.

In the invention of above Claim 4, since the destination can be set up based on the kind name displayed in a list, the operation burden of a user specifying the position of the institution on a map is mitigable.

[0015]In the navigation device of any 1 paragraph of Claims 1-4, [the invention of Claim 5] Have a list display means to display the list of kind names of said institution, and a selecting means which chooses the kind name in the list displayed on said list display means, and, [said institution displaying means] It is set up to display the institution near said current position on the next of the institution displayed now among the institutions corresponding to a kind name with said selected selecting means. In the invention of above Claim 5, since a corresponding kind name is only chosen and the institution near the next can be displayed even if it is a case where a user is not pleased with the nearest institution, instituting [which a user wishes truly] is quickly discoverable.

[0016]

[Mode for carrying out the invention]Next, an embodiment of the invention (it calls the following "embodiment") is concretely described with reference to Drawings. Although this embodiment can realize a computer by controlling by software, since the realization mode of the hardware in this case or software can be changed in some numbers, it uses the virtual circuit block which realizes each function of this invention and an embodiment by the following explanation.

[0017][1. composition] This embodiment is a thing about the navigation method performed on the navigation device (it calls the following "this device") of this invention, and this device, It can also grasp as recording media, such as the software for navigation itself, and CD-ROM, a flash memory, a ROM chip package which recorded such software, For example, it is one mode of this invention to also make the navigation device of each vehicles download and perform such software via communication networks, such as a portable telephone network.

[0018][Whole 1-1. composition] First, this device is provided with each of following elements shown in the functional block diagram of drawing 1. In order that [namely,] a position and the direction primary detecting element 1 may calculate the absolute position coordinate and direction in surface of the earth absolutely, the current position, i.e., the self-vehicle position, of a car (it is called a self-vehicle) in which this device was carried, For example, it is a portion for an antenna, a receiver, etc. to receive the GPS electric wave sent from a GPS Satellite. The relative bearing primary detecting element 2 is a portion for detecting the relative direction of a self-vehicle using a gyroscope etc. The vehicle speed primary detecting element 3 is a portion which calculates the speed of a self-vehicle by processing the vehicle speed pulse obtained from a car.

[0019]Main CPU and its peripheral circuit 4 are portions which play the role of the control circuit which controls this whole device. The memory groups M are various kinds of memories required for operation of this device, and ROM5 for program storing is accessed by main CPU at the time of starting of this device, for example. A main program is loaded to the dynamic RAM (DRAM) 6 which provides a work area etc. When the battery backup of the SRAM7 which backs up information, including a setup etc., is carried out and it is set to ON also while the main power supply was come by off, it provides the contents of a memory. VRAM8 for a display stores the bitmap data of the picture which should be displayed on the indicator 10.

[0020]By the liquid-crystal-display screen which is not illustrated, voice synthesis, etc., the indicator 10 is a portion to output various kinds of information, including a map, an operation menu, etc., and, [the input part 11] It is a portion for a user to input information, including a command etc., from a switch etc., and the position on a map can be specified or the item of a menu or a list can be chosen. The touch panel provided in the indicator 10 also functions as the input part 11. The user interface part 9 is a user interface which connects the indicator 10 and the input part 11, and main CPU and its peripheral circuit 4 using an I/O control circuit, a device driver, etc.

[0021]CD / DVD-ROM control part 12 is means which read the variety of information recorded on CD-ROM or DVD-ROM, and is a means to store beforehand the map information showing what kind of road and institution are where. As such map information, the image data for displaying a road, an icon (a current position mark and a landmark are included), character data, a menu, a list, etc., the course data for calculating the optimal path of a to [from a current position / the destination], etc. are contained, for example. About the institution, the database for search related with genres, such as a convenience store, a gas station, a bank, alcohol and a tobacco store, a hospital, and a pharmacy, with each position coordinate is contained.

[0022]FM multiplex reception and the treating part 13 are portions which perform processing which receives an FM broadcast wave and takes out the data of requests, such as traffic information of VICS service, from this broadcast wave, and traffic information includes traffic congestion information. Light, electric wave beacon reception, and the treating part 14 are portions which receive and process information, including the discernment information on an optical beacon or an electric wave beacon to each beacon installed in the road shoulder etc., the traffic information of VICS service, etc. The voice recognition part 15 is a portion which recognizes words, such as an instruction word, from a user's utterance inputted.

[0023][1-2. main CPU and the role of the peripheral circuit] Main CPU and its peripheral circuit 4 are constituted so that it may play a role of each of following portions shown in drawing 1 by operation of the above software. That is, the current position primary detecting element 40 is a means for calculating, the current position, i.e., the self-vehicle position, of a self-vehicle, and it is constituted so that a self-vehicle position may specifically be calculated by combining GPS navigation positioning and autonomous navigation positioning.

[0024]Here, GPS navigation positioning calculates a current position using information absolutely acquired from a position and the direction primary detecting element 1 based on an electric wave from an artificial satellite. Autonomous navigation positioning calculates a current position using information acquired from the relative bearing primary detecting element 2 and the vehicle speed primary detecting element 3 based on speed of geomagnetism and a self-vehicle.

[0025]The destination set part 41 is a setting means which specifies an institution made into a destination out of an institution contained in said map information. The course set part 42 is a means to calculate and set up a course to a specified destination. The guiding part 44 which is a means to control a display which needs the display control part 43 for navigation including a road, an icon, a menu, and a list is a means to show around by a screen display, a synthetic voice, etc. based on a set-up course.

[0026]The tab-control-specification part 45 is a means to specify a specific position on a display map as a point which should serve as a standard of search of a circumference institution. A position specified in this way is set up to become the current position automatically detected by the current position primary detecting element 40 when there is no specification in particular that used the input part 11 from a user.

[0027]The retrieval part 46 is a means to search an institution which is around a position specified by the tab-control-specification part 45 based on a database about channel information and an institution which were recorded on CD-ROM or DVD-ROM about two or more genres. It can set up freely, such as making, for example whether for this search to consider it as an institution separated from the specified position how much into a range which can be displayed on less than several kilometers in radius, and a display screen. The kind set part 47 is a means to set up a genre of an institution which the retrieval part 46 searches according to an input from the input part 11. Although a user can also set up this genre arbitrarily, when a user in particular does not set up, it can also be made into a genre decided by default. order with the extraction part 48 near a position specified by the tab-control-specification part 45 in an institution searched by the retrieval part 46 -- every genre -- or it is a means to extract about a specific genre.

[0028][2. operation] The processing procedure in this embodiment constituted as mentioned above is explained below with reference to the flow chart of drawing 2, drawing 3 - the example of a screen display of drawing 5. First, if a user uses the input part 11 and performs the directions input of a menu display when the map of the circumference of it is displayed on the indicator 10 with the current position of the self-vehicle so that it may illustrate to drawing 3, so that it may illustrate to drawing 4, The display control part 43 displays a menu on the indicator 10 (Step 201). A user chooses the function (for example, in drawing 4, it claims "to search the whole street corner ****") corresponding to this embodiment from these menus (Step 202). Then, the retrieval part 46 searches either of the institutions applicable to the genre set up by the kind set part 47 among the circumference institutions of a current position based on map information, and reads it on a memory (Step 203). This is repeated for each [which was set up] genre of every (Step 204).

[0029]When all are searched about the set-up genre, (Step 204) and the extraction part 48 extract one institution nearest to [in each genre] a current position at a time from the data read on the memory (Step 205). And the display control part 43 displays the extracted institution on a map as an icon based on the coordinate value, as shown in drawing 5 (Step 206). The genre name of the searched institution is also displayed in a list at this time (Step 207). If a user unites cursor with a desired genre name out of the displayed list (Step 208), the institution applicable to the genre will be lit up (Step 209). For example, at drawing 5, the gas station is surrounded with the square.

[0030]Based on map information, the distance from a current position to the institution, a direction (drawing 5 arrow), etc. are calculated and displayed with the lit-up facility name. And if the "determination" displayed on (Step 210) and the right of a list is chosen to make this institution into the destination (Step 211), the destination set part 41 will set up the lit-up institution as a destination (Step 212). Then, although course calculation by the course set part 42 and navigation by the guiding part 44 are performed (Step 213), since it is the same as that of the usual navigation, explanation is omitted.

[0031]The genre name in a list is chosen to investigate an institution near a current position to the next of a lit-up institution at Step 210 (Step 214). Then, the extraction part 48 extracts an institution near the next in an institution in the genre out of data read on a memory (Step 215). A subsequent procedure is the same as that of Step 206 to the step 213.

[0032][3. effect] As explained above, since two or more genres can be covered, an institution near a user's current position can be automatically searched with this embodiment and the nearest institution can be displayed, time to investigate two or more genres and time and effort can save sharply. Since an institution in two or more genres can be displayed on order near a current position, a user tends to look for instituting [which he wishes truly]. Since a corresponding genre name in a list display is only chosen and an institution near the next can be displayed even if it is a case where a user is not pleased with the nearest institution in particular, instituting [which a user wishes truly] is quickly discoverable.

[0033]Since a user can set up beforehand a genre of an institution which is the target of search and extraction, only a required institution can attain improvement in the speed of processing, and easy-ization of access to an institution of choice as an object of search and extraction by narrowing down and setting to a genre used well.

[0034]Since the current position used as the starting point of the usual navigation serves as a standard of search and extraction of a circumference institution automatically when a user in particular does not set up, the time and effort as which a user specifies a position can be saved. Since the institution used as the destination can be set up only by choosing the determination button displayed beside the genre name displayed in a list, the operation burden of a user specifying the institution of the request on a map is mitigable.

[0035][An embodiment] besides 4. This invention is not limited to the above-mentioned embodiment, and contains other embodiments which are illustrated next. For example, the kind (genre) or the number of kinds of the institution which is the target of search and extraction are not limited to what was illustrated by the above-mentioned embodiment. For example, they may be things other than buildings, such as a park and a natural object, and other artificial equipment. It is free also about extensive ** of the concept of the "kind" as a search condition, and is not limited to what was illustrated above. For example, various expressions are possible from a comparatively large expression of a building, a park, etc. to a comparatively narrow expression of a store name, a company name, a branch, a branch name, etc.

[0036]The position used as the standard of search and extraction of a circumference institution is not limited to a current position. For example, when the destination which the user displayed by temporary destination search is specified, or when the point on the map arbitrarily displayed by scroll operation etc. is specified, a tab-control-specification part can specify the position, and it can also set up so that the institution of the circumference of it may be searched and extracted. It is also possible to make the specified position into the to some extent wide range. It can also be beforehand set up by default whether the institution separated from the specified position how much is made into a retrieval object, and a user can also set up arbitrarily.

[0037]

[Effect of the Invention]As mentioned above, according to this invention, the art, i.e., the navigation device, the method, and the software for navigation of the navigation which can search and display the institution near the specific position on a map for a short time covering two or more kinds by easy operation can be provided.

[Brief Description of the Drawings]

[Drawing 1]The functional block diagram showing the composition of the embodiment of this invention.

[Drawing 2]The flow chart which shows the processing procedure in the embodiment of this invention.

[Drawing 3]The figure showing the usual example of a map display screen in the embodiment of this invention.

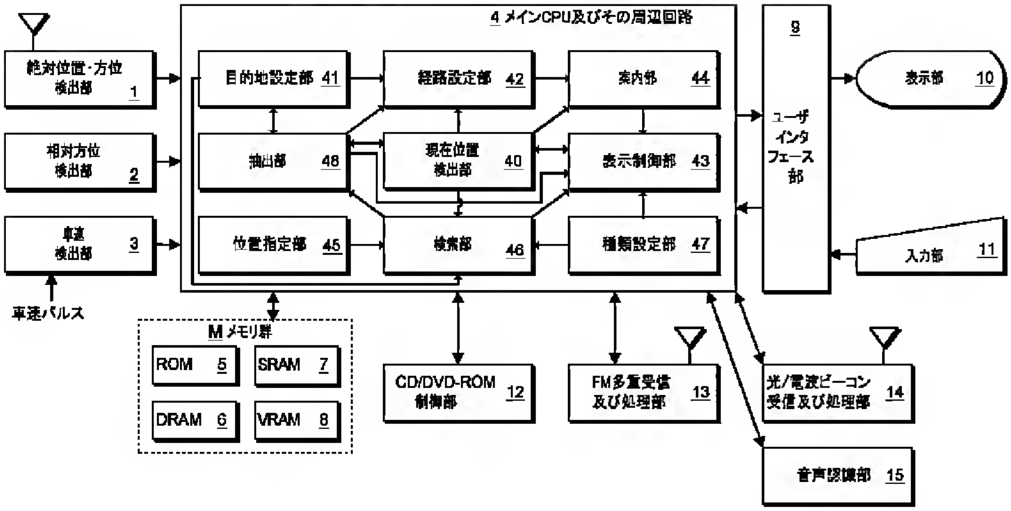
[Drawing 4]The figure showing the example of a display screen of the menu button in the embodiment of this invention.

[Drawing 5]The figure showing the lit-up example of a display screen of an institution icon and a genre list in the embodiment of this invention.

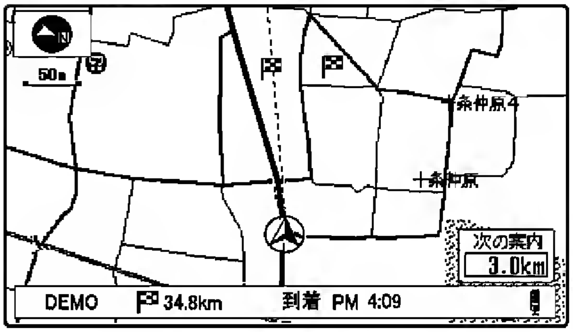
[Explanations of letters or numerals]

1 -- They are a position and a direction primary detecting element absolutely.
2 -- Relative bearing primary detecting element
3 -- Vehicle speed primary detecting element
4 -- Main CPU and its peripheral circuit
5 -- ROM
6 -- DRAM
7 -- SRAM
8 -- VRAM
9 -- User interface part
10 -- Indicator
11 -- Input part
12 -- CD / DVD-ROM control part
13 -- FM multiplex reception and treating part
14 -- Light / electric wave beacon reception, and treating part
15 -- Voice recognition part
40 -- Current position primary detecting element
41 -- Destination set part
42 -- Course set part
43 -- Display control part
44 -- Guiding part
45 -- Tab-control-specification part
46 -- Retrieval part
47 -- Kind set part
48 -- Extraction part
M -- Memory group

[Drawing 1]


4 メインCPU及びその周辺回路
絶対位置・方位検出部 1
相対方位検出部 2
車速検出部 3
車速パルス
目的地設定部 41
経路設定部 42
案内部 44
抽出部 48
現在位置検出部 40
表示制御部 43
位置指定部 45
検索部 46
種類設定部 47
9 ユーザインタフェース部
表示部 10
入力部 11
M メモリ群
ROM 5
SRAM 7
DRAM 6
VRAM 8
CD/DVD-ROM制御部 12
FM多重受信及び処理部 13
光/電波ビーコン受信及び処理部 14
音声認識部 15

[Drawing 3]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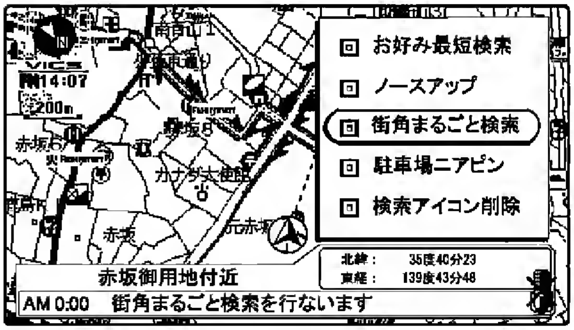
[Drawing 4]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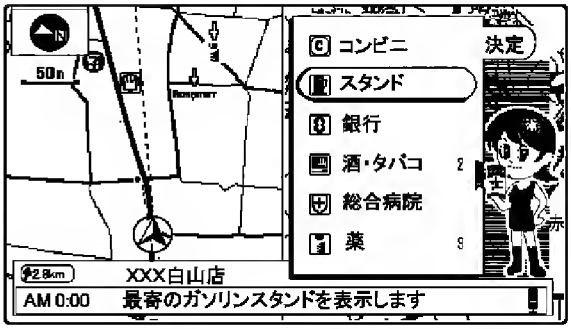
カナダ大使館
元赤坂
赤坂
□ お好み最短検索
□ ノースアップ
□ 街角まるごと検索
□ 駐車場ニアピン
□ 検索アイコン削除

北緯： 35度40分23
東経： 139度43分48

赤坂御用地付近

AM 0:00 街角まるごと検索を行ないます

[Drawing 5]


50m
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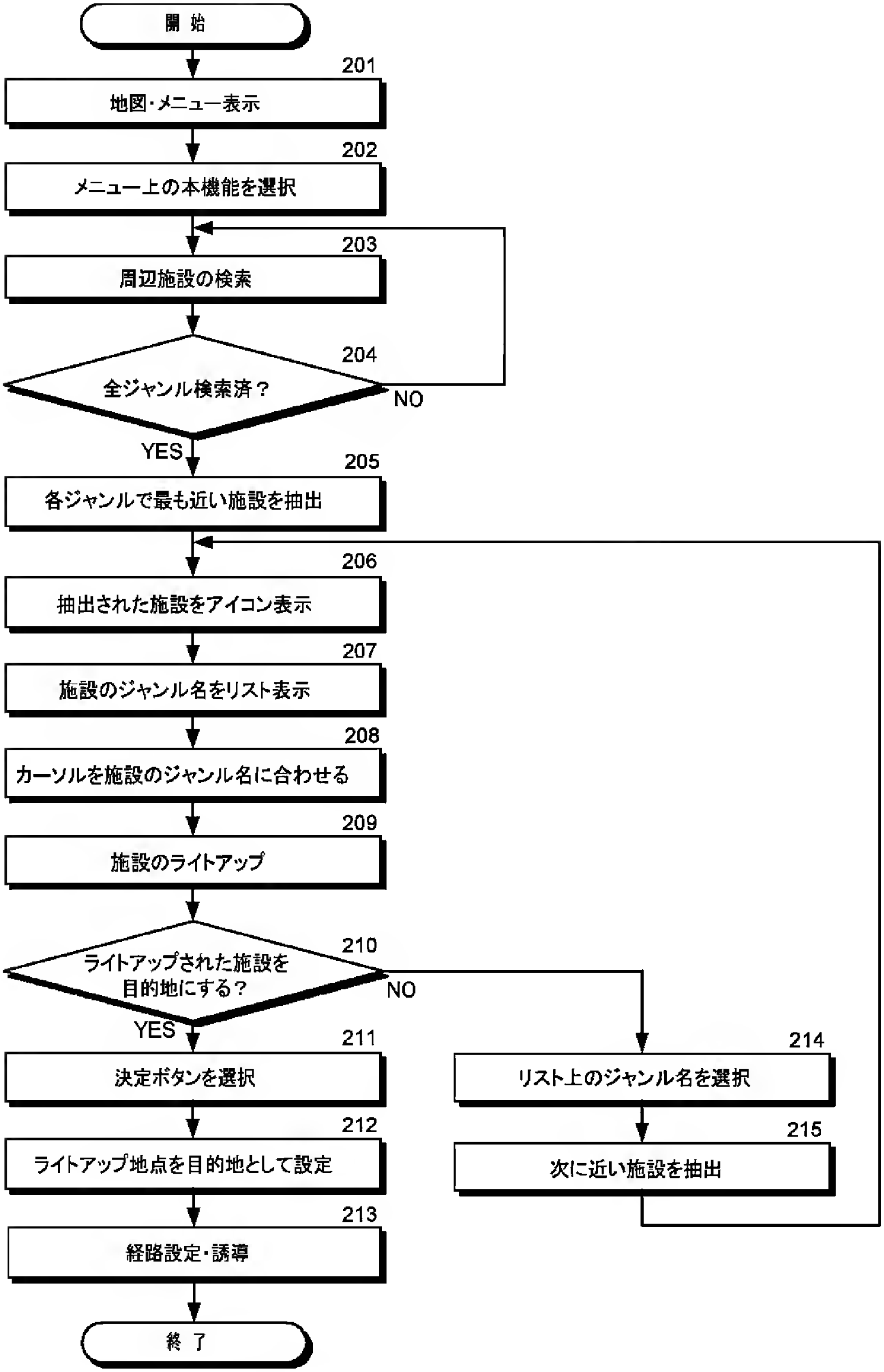
スタンド
銀行
酒・タバコ
総合病院
薬
決定
2.8km

XXX白山店

AM 0:00 最寄のガソリンスタンドを表示します

[Drawing 2]


開 始
201
地図·メニュー表示
202
メニュー上の本機能を選択
203
周辺施設の検索
204
全ジャンル検索済？
NO
YES
205
各ジャンルで最も近い施設を抽出
206
抽出された施設をアイコン表示
207
施設のジャンル名をリスト表示
208
カーソルを施設のジャンル名に合わせる
209
施設のライトアップ
210
ライトアップされた施設を目的地にする？
NO
YES
211
決定ボタンを選択
212
ライトアップ地点を目的地として設定
213
経路設定·誘導
終 了
214
リスト上のジャンル名を選択
215
次に近い施設を抽出

[Translation done.]